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Report on  
**THE TOPOGRAPHIC  
AND GEOLOGIC SURVEY**  
Department of Internal Affairs

presented by

THE GEOLOGIC ADVISORY COMMITTEE

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SERVICES AND RESOURCE USES,  
INDUSTRIAL AND URBAN PLANNING,  
CONSERVATION AND RECREATION

PY G345/4.2 R425g  
Pennsylvania. Topographic  
and Geological Survey  
Report of the Geologic  
Advisory Committee

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JULY - 1967

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## FOREWORD

THE BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY IN THE DEPARTMENT OF INTERNAL AFFAIRS SERVES PENNSYLVANIA BY PROVIDING ESSENTIAL DATA NEEDED FOR WISE USE AND CONSERVATION OF OUR NATURAL MINERAL RESOURCES, FOR LOCATING TRANSPORTATION SYSTEMS AND INDUSTRIES, FOR WATER RESOURCE MANAGEMENT, FOR ZONING IN COMMUNITIES, FOR WASTE DISPOSAL AND POLLUTION CONTROL, AND FOR LOCATION OF PARKS AND OTHER PUBLIC RECREATION CENTERS. THE DATA PROVIDED IS INFORMATION ON TOPOGRAPHY, SURFACE GEOLOGY, GROUND WATER RESOURCES, SUBSURFACE STRUCTURE, AND MINERAL DEPOSITS. THE SURVEY HAS THE DUTY TO GATHER, ANALYZE AND DISSEMINATE THIS DATA.

SUCH INFORMATION SERVES INDUSTRIAL AND URBAN PLANNERS, AND FEDERAL, STATE, AND LOCAL GOVERNMENTAL UNITS CHARGED WITH REGULATING THE WISE USE OF LAND AND RESOURCES FOR THE GREATEST INDIVIDUAL AND SOCIAL GOOD. IT IS ALSO ESSENTIAL FOR A MULTITUDE OF INDIVIDUAL DECISIONS IN THE PRIVATE SECTOR--IN INDUSTRY, IN COMMERCE, IN CONSTRUCTION.

THERE IS INCREASING NEED IN PENNSYLVANIA, IN THE CRITICAL PERIOD IN THE LAST THIRD OF THIS CENTURY, FOR GEOLOGICAL RESEARCH AND INFORMATION BECAUSE OF THE QUICKENING PACE OF TECHNOLOGY AND URBAN DEVELOPMENT. THE HEALTH AND GROWTH OF INDUSTRY ESSENTIAL IN OUR HIGHLY DEVELOPED TECHNOLOGICAL SOCIETY DEMANDS MORE AND BETTER INFORMATION ON THE LOCATION AND NATURE OF MINERAL AND WATER RESOURCES. THE URBAN POPULATION SPRAWL, INCREASINGLY SPILLING OVER INTO PENNSYLVANIA FROM THE MEGALOPOLIS TO THE EAST, BRINGS A RELENTLESS CONTINUING EXPANSION OF COMMUNITIES AND SUBURBS INTO THE WOODS AND FIELDS AND MOUNTAINS OF PENNSYLVANIA. DECISIONS TO BE MADE IN THE NEXT DECADES ON THE USE OF LAND WILL SHAPE PENNSYLVANIA FOR BETTER OR WORSE FOR GENERATIONS TO COME. POLICIES OF GOVERNMENT AND OTHER ORGANIZATIONS ON CONTROL OF OUR ENVIRONMENT, ON THE USE OF OUR RESOURCES, AND ON THE CONSERVATION OF NATURAL BEAUTY, WILL PROFOUNDLY INFLUENCE OUR ECONOMY AND THE QUALITY OF LIFE IN THE COMMONWEALTH.

THE RAPID INCREASE IN THE SOPHISTICATION AND APPLICATION OF GEOLOGICAL SCIENCE ON THE ONE HAND, AND THE INCREASING NEED FOR NON-GEOLOGISTS IN GOVERNMENT, IN PLANNING GROUPS, AND AS INDIVIDUALS TO UTILIZE HIGHLY TECHNICAL INFORMATION PLACE A SPECIAL CHALLENGE TO THE GEOLOGIC SURVEY TO KEEP ABREAST OF DEVELOPMENTS, TO PROVIDE THE DATA NEEDED IN PENNSYLVANIA, AND TO COMMUNICATE ITS FINDINGS EFFECTIVELY TO A BROADER CLIENTELE THAN EVER BEFORE.

BECAUSE OF THE GROWING CHALLENGE TO STATE GOVERNMENT TO FUNCTION EFFECTIVELY AND ECONOMICALLY IN PROVIDING CRITICAL SERVICES TO SOCIETY, THE GEOLOGIC SURVEY ADVISORY COMMITTEE WAS FORMED AND ASKED TO DETERMINE WHETHER "THE SURVEY IS GIVING MAXIMUM SERVICE TO PENNSYLVANIA AND, IF NOT, TO RECOMMEND HOW THE SERVICE CAN BE IMPROVED." WE URGE THAT THE CONSIDERED RECOMMENDATIONS OF THIS NONPARTISAN COMMITTEE, COMPRISED OF PROFESSIONALS REPRESENTATIVE OF PENNSYLVANIA'S REGIONS AND INDUSTRIES AND PLANNERS, CONSTITUTE IMPORTANT GUIDELINES FOR INSURING CONTINUED



EXCELLENCE AND EFFECTIVENESS THAT WE MUST REQUIRE IN THE GEOLOGIC SURVEY.

WE RECOGNIZE THAT EXPANDED SERVICE WILL REQUIRE EXPANDED SUPPORT. THE CONSEQUENCES OF DECISIONS THAT DEPEND ON THE INFORMATION REQUIRED ARE SO GREAT IN THE CRITICAL PERIOD AHEAD THAT TO STINT ON THE PROGRAMS OF OUR GEOLOGIC SURVEY WOULD SURELY BE "PENNY WISE AND POUND FOOLISH."



## SUMMARY

THE GEOLOGIC SURVEY ADVISORY COMMITTEE COMPRISED OF PENNSYLVANIA GEOLOGISTS AND OTHER CITIZENS DRAWN FROM INTERESTED INDUSTRIES, COMMUNITIES, AND ORGANIZATIONS IN PENNSYLVANIA WAS REQUESTED BY THE HONORABLE JOHN K. TABOR, SECRETARY, DEPARTMENT OF INTERNAL AFFAIRS OF THE COMMONWEALTH OF PENNSYLVANIA TO DETERMINE WHETHER GOALS, POLICIES, AND PROGRAMS OF THE BUREAU OF TOPOGRAPHY AND GEOLOGIC SURVEY PROVIDE THE OPTIMUM SERVICE TO PENNSYLVANIA, AND IF NOT, TO RECOMMEND HOW THE SERVICE CAN BE IMPROVED.

OPERATING UNDER ITS CHAIRMAN, LAWRENCE LITCHFIELD, JR., DIRECTOR AND FORMER CHAIRMAN OF THE BOARD OF THE ALUMINUM COMPANY OF AMERICA, AND VICE CHAIRMAN DONALD M. FRASER, CHIEF GEOLOGIST OF THE BETHLEHEM STEEL CORPORATION, THREE MEETINGS OF THE FULL COMMITTEE WERE HELD IN HARRISBURG BETWEEN APRIL 21 AND JUNE 23, 1967. THE COMMITTEE'S WORK WAS FURTHER AIDED BY WRITTEN SUGGESTIONS FROM ITS MEMBERS AND BY THE WORK AND REPORTS OF FIVE SUBCOMMITTEES. THE COMMITTEE IS GRATEFUL FOR THE COOPERATION OF SECRETARY TABOR, OF THE STATE GEOLOGIST, DR. ARTHUR A. SOCOLOW, AND OF THEIR ASSOCIATES.

STATEMENTS OF THE MAJOR PROGRAMS OF THE BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY AND OF THE NEED FOR THE SURVEY PROGRAM ARE PRESENTED IN APPENDIX I OF THIS REPORT, TOGETHER WITH INFORMATION ON THE BUREAU'S PERSONNEL.

THE COMMITTEE FINDS THE SURVEY THOROUGHLY PROFESSIONAL, CAPABLY LED, AND HIGHLY RESPECTED IN ITS FIELD. IN OUR ESTIMATION, THE STATE GEOLOGIC SURVEY SHOULD CONTINUE TO FULFILL THE FUNCTIONS IT HAS IN THE PAST IN GATHERING, ANALYZING, AND DISSEMINATING INFORMATION; BUT IT SHOULD NOW OPERATE WITH MORE OF AN EYE TOWARD THE DATA NEEDS OF A MUCH BROADER CLIENTELE.

THERE NEEDS TO BE AN INTENSIFICATION OF THE AGENCY'S EFFORTS TO PROVIDE MORE EXTENSIVE, MORE UP-TO-DATE, MORE READILY AVAILABLE DATA FOR THE MINERAL INDUSTRIES AND FOR GOVERNMENT DEPARTMENTS. THERE ALSO NEEDS TO BE MARKED EXPANSION OF SERVICES PROVIDING DATA TO COMMUNITIES AND PLANNERS CONCERNING URBAN RENEWAL AND URBAN AND INDUSTRIAL EXPANSION. IN ALL OF THIS THERE IS A NEED FOR GREATER EFFORT TO MAKE THE MEANING AND USE OF THE DATA BETTER UNDERSTOOD ESPECIALLY TO URBAN GROUPS AND PLANNERS AND INDIVIDUALS OR ORGANIZATIONS WHO ORDINARILY ARE NOT VERSED IN GEOLOGY AND THE LANGUAGE IN WHICH GEOLOGICAL INFORMATION IS CLOTHED. THE SURVEY MUST, THROUGH REGIONAL OFFICES AND INTERPRETATION OF THEIR TECHNICAL REPORTS, MAKE SPECIAL EFFORT TO SEE THAT LAY GROUPS RECEIVE AND CAN USE THE SURVEY'S SERVICES.

FINALLY, WHILE THE SURVEY SHOULD NOT BECOME IN ITSELF A REGULATORY AGENCY IN ANY SENSE, IT SHOULD BE SO PLACED IN THE COMMONWEALTH'S ADMINISTRATIVE STRUCTURE THAT THE INFORMATION IT DEVELOPS AND



THE TECHNICAL VIEWS BASED THEREON ARE STRONGLY REPRESENTED IN THOSE COUNCILS OF GOVERNMENT WHERE PROBLEMS OF NATURAL RESOURCES, CONSERVATION, WATER CONTROL, POLLUTION, WASTE DISPOSAL, INDUSTRIAL EXPANSION, AND URBAN RENEWAL AND GROWTH ARE SUBJECTS FOR CONSIDERATION.

ALTHOUGH THE ADVISORY COMMITTEE REALIZES THAT ALL OF THE GOALS OF ENHANCING THE STRENGTH AND EFFICIENCY OF THE SURVEY CANNOT BE ACHIEVED OVERNIGHT, WE URGE ADOPTION OF A PLAN TO BRING THEM WITHIN REACH WITHIN THE NEXT FIVE YEARS.

THE COMMITTEE'S SPECIFIC RECOMMENDATIONS TOWARD THESE ENDS ARE PRESENTED BELOW. THEY ARE THE HEART OF THIS REPORT.





## RECOMMENDATIONS

### I. RECOMMENDATIONS ON NEW OR REVISED EMPHASIS - OBJECTIVES AND PROJECTS.

TO PROVIDE MORE UP-TO-DATE AND EXTENSIVE DATA NEEDED TO ENHANCE INDUSTRIAL AND URBAN GROWTH, WE STRONGLY RECOMMEND:

1. THAT TOPOGRAPHIC AND GEOLOGIC QUADRANGLE MAPPING PROGRAMS BE ACCELERATED TO PROVIDE FREQUENT REVISION OF MAPS COVERING AREAS OF THE COMMONWEALTH WHERE THE GREATEST POTENTIAL FOR INDUSTRIAL AND RESOURCE DEVELOPMENT EXISTS;
2. THAT REGIONAL GEOLOGICAL STUDIES BE ACCELERATED TO PROVIDE EXISTING AND POTENTIAL NEW INDUSTRIES WITH NEEDED BASIC DATA; THAT CONTIGUOUS REGIONAL RESOURCE MAPS BE COMPILED, AND FREQUENTLY UPDATED, TO FACILITATE THE DEVELOPMENT OF NATURAL RESOURCES;
3. THAT AN INVENTORY OF WATER AND MINERAL RESOURCES OF THE COMMONWEALTH BE FREQUENTLY UPDATED, REVISED, AND REPRINTED TO MEET CURRENT NEEDS;
4. THAT SELECTED MINERAL-ECONOMIC FEASIBILITY STUDIES, DEALING WITH RESOURCES OF LONG-RANGE POTENTIAL, BE INCLUDED WITHIN THE SURVEY PROGRAM;
5. THAT SURVEY DATA BE MADE AVAILABLE AS EARLY AS PRACTICABLE, ON A CURRENT BASIS WHENEVER POSSIBLE;
6. THAT THE SURVEY COORDINATE ITS ACTIVITIES WITH ALL GOVERNMENTAL DEPARTMENTS OR AGENCIES THAT HAVE USEFUL RELATED DATA, TO INSURE OPTIMUM UTILIZATION AND DISTRIBUTION;
7. THAT THE SURVEY UTILIZE AND SUPPORT PROGRAMS, AS IS ECONOMIC AND DESIRABLE, IN ACADEMIC INSTITUTIONS AND IN OTHER ORGANIZATIONS, WHEN THEY OFFER EFFICIENT MEANS OF MEETING PRESENT AND FUTURE SURVEY NEEDS;
8. THAT GREAT EMPHASIS BE PLACED ON COMMUNICATING THE SURVEY'S DATA TO USERS AND POTENTIAL USERS.

### II. RECOMMENDATIONS ON MINERAL DEVELOPMENT - WISE LAND USE.

OPTIMUM UTILIZATION OF PENNSYLVANIA'S PHYSICAL RESOURCES--MINERALS, LAND AND WATER--DEMANDS CONSIDERATION OF HOW DEVELOPMENT OF ONE RESOURCE AFFECTS THE OTHERS. RECOGNIZING THAT SOUND DECISIONS MUST BE BASED ON KNOWLEDGE AND UNDERSTANDING BY ALL GROUPS ENGAGED IN INDUSTRIAL DEVELOPMENT, ENGINEERING AND CONSTRUCTION, RECREATION, AND PLANNING AND ZONING, WE RECOMMEND:



1. THAT A PROGRAM BE IMPLEMENTED BY THE SURVEY IN COOPERATION WITH APPOINTED OR ELECTED MUNICIPAL OFFICIALS AND BODIES WITHIN THE COMMONWEALTH TO OFFER CONSTRUCTIVE GUIDANCE IN ZONING, AREA DEVELOPMENT, LAND USE, AND OTHER PHASES OF URBAN FRINGE AND SUBURBAN DEVELOPMENT WHERE KNOWLEDGE OF GEOLOGIC ENVIRONMENT CAN BE OF VALUE;
2. THAT THE BALANCED EXPANSION OF SURVEY ACTIVITIES BE CARRIED OUT IN A MANNER CONSISTENT WITH THE INDIVIDUAL IMPORTANCE INHERENT IN MINERAL AND SOIL CONSERVATION, RECREATION, INDUSTRIAL DEVELOPMENT, PLANNING AND ZONING, AND WITH RECOGNITION OF THE ECONOMIC IMPORTANCE OF EACH OF THESE AS THEY REFER TO THE GENERAL WELFARE.

### III. RECOMMENDATIONS ON PUBLIC RELATIONS AND COMMUNICATIONS.

IT IS NECESSARY NOT ONLY THAT PROFESSIONAL GEOLOGISTS IN INDUSTRY AND ELSEWHERE KNOW OF AND USE SURVEY DATA BUT INCREASINGLY THAT LAY MEMBERS OF INDUSTRIAL AND URBAN PLANNING GROUPS AS WELL BE MADE AWARE OF THE DATA AND ITS SIGNIFICANCE. TO THESE ENDS IT IS RECOMMENDED:

1. THAT THE SURVEY INSTITUTE A PROGRESSIVE PUBLIC RELATIONS PROGRAM OUTLINING THE SURVEY'S OBJECTIVES AND GOALS AND THE VALUE OF GEOLOGY TO THE CULTURE AND ECONOMY OF THE COMMONWEALTH;
2. THAT THE SURVEY COMMENCE THE PUBLICATION AND WIDE CIRCULATION OF A MAGAZINE OF HIGH QUALITY WHICH WILL COMBINE INDIVIDUAL RELEASES NOW MADE INTO ONE FORMAT AND WHICH WILL SERVE TO FURTHER STRENGTHEN THE IDENTITY OF THE SURVEY PROGRAMS;
3. THAT REPRESENTATIVES OF THE SURVEY FREQUENTLY ATTEND SELECTED PROFESSIONAL AND INDUSTRIAL MEETINGS WHERE SURVEY EXPOSURE CAN PROMOTE THE WELFARE OF THE COMMONWEALTH AS WELL AS CONTRIBUTE TO THE PROFESSIONAL STATURE OF THE INDIVIDUAL MEMBERS OF THE SURVEY AND TO THE INDUSTRIAL PROGRESS OF THE COMMONWEALTH.

### IV. RECOMMENDATIONS ON ADMINISTRATION.

TO INSURE THAT THE SURVEY IS IN A POSITION TO PROVIDE THE MOST EFFECTIVE SERVICES TO PENNSYLVANIA, IT IS RECOMMENDED:

1. THAT THE BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY ADVISORY COMMITTEE BE NAMED A CONTINUING COMMITTEE AND BE CALLED INTO SESSION AT LEAST ONCE A YEAR TO REVIEW SURVEY PROGRESS, TO RECOMMEND NEW PROGRAMS, OR TO ADD THE WEIGHT OF ITS MEMBERSHIP TO SURVEY PROPOSALS PENDING BEFORE AGENCIES OF THE FEDERAL GOVERNMENT;



2. THAT THE SURVEY BE REPRESENTED ON THOSE COUNCILS WITHIN GOVERNMENT WHERE PROBLEMS OF NATURAL RESOURCES, CONSERVATION, WATER CONTROL, OR POLLUTION ARE CONSIDERED;
3. THAT PROFESSIONAL APPOINTMENTS WITHIN THE SURVEY BE PLACED UNDER CIVIL SERVICE, WITH AT LEAST FIVE GRADES, FROM GEOLOGIST 1 TO GEOLOGIST 5, WITH SALARY SCALES NO LOWER THAN THE FEDERAL SCALE FOR CORRESPONDING GRADES;
4. THAT SELECTED SURVEY GEOLOGISTS BE ASSIGNED TO SPECIAL COURSES TO STUDY OR TRAINING AS THE STATE GEOLOGIST DEEMS NECESSARY OR DESIRABLE FOR THE MOST EFFICIENT CONDUCT OF THE SURVEY'S WORK;
5. THAT TO ENHANCE FURTHER THE SERVICES OFFERED TO INDUSTRY AND THE COMMUNITY THE PITTSBURGH BRANCH OFFICE OF THE SURVEY BE SUPPLEMENTED BY OFFICES ON THE CAMPUS OF PENNSYLVANIA STATE UNIVERSITY, IN THE PHILADELPHIA REGION, AND IN OTHER LOCATIONS AS THE NEED MIGHT ARISE.



MAJOR PROGRAMSBUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY

I DETAILED GEOLOGIC MAPPING AND STUDIES, AREA BY AREA, ACROSS PENNSYLVANIA.

TO OBTAIN COMPREHENSIVE RECORD OF ALL PHYSICAL RESOURCES AND ENVIRONMENTAL CONDITIONS FOR ANY POSSIBLE FUTURE DEVELOPMENT OR UTILIZATION, SUCH AS ROAD BUILDING, PLANNING AND ZONING, CONSTRUCTION SITES, AGRICULTURAL DEVELOPMENT, CONSERVATION, AND RECREATIONAL FACILITIES.

II MINERAL RESOURCES STUDIES.

TO STUDY AND RECORD GEOLOGIC DATA ON KNOWN MINERAL RESOURCES, TO LOCATE NEW MINERAL RESOURCES AND TO INVESTIGATE AND RECORD RESOURCES NOT NOW USABLE BUT POTENTIALLY USABLE IN THE FUTURE.

III GROUNDWATER INVESTIGATIONS.

TO STUDY THE QUANTITY AND QUALITY OF THE SUBSURFACE WATER AVAILABLE IN THE VARIOUS ROCK FORMATIONS WHICH OCCUR UNDER DIVERSE STRUCTURAL SITUATIONS IN DIFFERENT PARTS OF PENNSYLVANIA.

IV TOPOGRAPHIC MAPPING.

TO ARRANGE FOR DETAILED AND UP-TO-DATE TOPOGRAPHIC MAPS OF ALL OF PENNSYLVANIA, SHOWING SURFACE CONDITIONS INCLUDING ELEVATIONS, SLOPES, VARIOUS PHYSICAL FEATURES, ROADS, BUILDINGS, AND POLITICAL BOUNDARIES. TOPOGRAPHIC MAPS SERVE AS A BASE FOR ALL PLANNING, ENGINEERING, AGRICULTURE, INDUSTRIAL, AND RECREATIONAL PROJECTS.

V SERVICES.

A. TO INDUSTRY

DATA ON NEW MINERAL RESOURCES AVAILABLE FOR DEVELOPMENT.  
INFORMATION ON BETTER UTILIZATION OF KNOWN MINERAL RESOURCES.  
COUNSEL ON AVAILABLE WATER RESOURCES.  
DATA ON SITE CONSTRUCTION PROBLEMS.

B. TO STATE GOVERNMENT (PARTIAL LIST OF SERVICE EXAMPLES):

COUNSEL TO HIGHWAY DEPT ON CONSTRUCTION CONDITIONS AND MINERAL LAND DAMAGES.  
GEOLOGICAL AND MINERAL RESOURCE EVALUATION OF DAM SITES AND GAME LANDS FOR FISH AND GAME COMMISSIONS.  
EVALUATION OF AVAILABLE GROUNDWATER FOR AGRICULTURE DEPT IRRIGATION STUDIES, AND PREPARATION OF TOPOGRAPHIC BASE MAPS.





MINERAL RESOURCE DATA FOR FORESTS & WATERS, FORESTS & PARKS, INCLUDING ELEMENTARY GEOLOGY STORIES OF STATE PARKS.

BASIC GROUNDWATER DATA FOR DEPT OF HEALTH.

AVAILABILITY OF VARIOUS RAW MINERALS AND WATER FOR DEPT OF COMMERCE; MINERAL GUIDANCE RE PROJECT 70.

GUIDANCE TO DEPT OF PUBLIC INSTRUCTION ON EARTH SCIENCES CURRICULUM AS WELL AS PARTICIPATION IN DPI CONSERVATION WORKSHOPS.

BASIC DATA ON GEOLOGY AND DISTRIBUTION OF COAL RESOURCES TO DEPT OF MINES & MINERAL INDUSTRIES; ALSO TOPOGRAPHIC BASE MAPS.

DATA ON PRESENT AND FUTURE MINERAL RESOURCES TO STATE PLANNING BOARD.

C. To LOCAL GOVERNMENT (COUNTY, DISTRICT, MUNICIPAL)

GROUNDWATER AVAILABILITY TO AUGMENT MUNICIPAL WATER SUPPLIES.

COUNSEL ON MINERAL RESOURCES DISTRIBUTION, WATER SUPPLIES, AND GROUND CONSTRUCTION CONDITIONS TO AID IN ZONING AND PLANNING.

D. To FEDERAL GOVERNMENT.

SUPPLY GEOLOGIC MAPS, WATER RESOURCE DATA, AND MINERAL RESOURCE STUDIES ON:

DELAWARE, OHIO, SUSQUEHANNA, POTOMAC, AND GENESEE RIVER BASINS TO THE U.S. CORPS OF ENGINEERS, DEPT OF HEALTH, EDUCATION, AND WELFARE, DEPT. OF AGRICULTURE, U.S. GEOLOGICAL SURVEY, U.S. BUREAU OF MINES.

SUPPLY MINERAL RESOURCE DATA TO U.S. GEOLOGICAL SURVEY AND U.S. BUREAU OF MINES FOR APPALACHIA RESOURCE STUDY, APPALACHIA MINE DRAINAGE RESEARCH, AND STRIP MINE RECLAMATION PROGRAM.

E. To INDIVIDUAL CITIZENS & CITIZEN GROUPS.

IDENTIFY ROCKS, MINERALS, FOSSILS.

ADVISE RE PROSPECTING POSSIBILITIES.

ADVISE RE COLLECTING ROCKS, MINERALS AND FOSSILS AS HOBBY.

ADVISE ON MINERAL AND WATER CONSERVATION.

ADVISE ON RELATIONSHIP OF ROCKS TO LANDSCAPE AND RESULTING PLANNING.

ADVISE ROLE OF MINERALS IN OUR ECONOMY.

ADVISE ON GEOLOGY AS A CAREER.

ADVISE ON GEOLOGY AND CONSERVATION PROJECTS FOR SCIENCE FAIRS.



NEED FOR SURVEY PROGRAMS

ACCURATE AND UP-TO-DATE GEOLOGIC AND TOPOGRAPHIC DATA ARE OF FUNDAMENTAL IMPORTANCE TO ALL SEGMENTS OF OUR ECONOMY INCLUDING THE MINERAL INDUSTRY, INDUSTRIAL DEVELOPMENT, ENGINEERING & CONSTRUCTION, AGRICULTURE, CONSERVATION & RECREATION, PLANNING & ZONING, WATER DEVELOPMENT, AND WASTE DISPOSAL. THE BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY IS THE ONLY ORGANIZATION IN PENNSYLVANIA WHICH IS SYSTEMATICALLY COVERING THE STATE WITH DETAILED GEOLOGIC AND TOPOGRAPHIC MAPS AND REPORTS.

TOPOGRAPHIC CONTOUR MAPS GIVE A QUANTITATIVE RECORD OF THE LAND-FORMS OF TOPOGRAPHY SO AS TO ENABLE THE VIEWER TO DETERMINE THE ELEVATION OF AND GIVEN POINT, THE DEGREE OF ANY SLOPE, THE LOCATION AND FORM OF ALL SURFACE DRAINAGE, LAKES AND SWAMPS AS WELL AS ALL MAN-MADE FEATURES INCLUDING ROADS, RAILROADS, DAMS, BRIDGES, MAJOR BUILDINGS, AND EXCAVATIONS. THIS DATA, RECORDED ON DETAILED TOPOGRAPHIC MAPS, IS NECESSARY TO PLAN AND BUILD ROADS, INDUSTRIAL SITES, RAILROADS, RECREATION FACILITIES, AND CONSERVATION PROJECTS. TOPOGRAPHIC MAPS ARE ALSO NEEDED AS BASE MAPS ON WHICH TO RECORD GEOLOGIC DATA AND SOIL DATA; TOPOGRAPHIC MAPS ARE VITAL FOR COMMUNITY PLANNING AND ZONING, EROSION CONTROL, WATER RESERVOIR CONSTRUCTION AND SCHOOL SITE DEVELOPMENT. TO BE USEFUL IN THESE VARIOUS FUNCTIONS WHICH AFFECT ALL SEGMENTS OF OUR POPULATION, THE TOPOGRAPHIC MAPS MUST BE ACCURATE, UP-TO-DATE, AND ON A SCALE WHICH WILL YIELD SUFFICIENT DETAIL FOR LOCAL AS WELL AS REGIONAL USE.

THE GEOLOGY OF PENNSYLVANIA INCLUDES ITS MINERAL RESOURCES, ROCK FORMATIONS, AND GROUNDWATER RESOURCES. GEOLOGICAL STUDIES ARE ACCOMPLISHED BY EXAMINING THE ROCKS AND MINERAL DEPOSITS AND RECORDING DATA FOR THE PREPARATION OF GEOLOGIC REPORTS, MAPS AND CROSS SECTIONS. ROCK, MINERAL, AND FOSSIL SAMPLES ARE COLLECTED IN THE FIELD FOR STUDY IN THE LABORATORY TO ROUND OUT A COMPREHENSIVE TEXT DESCRIPTION OF THE GEOLOGIC CONDITIONS. CONTINUED GEOLOGICAL INVESTIGATIONS AND RESEARCH ARE NECESSARY TO MAINTAIN PENNSYLVANIA'S RANKING AS THE LARGEST MINERAL-PRODUCING STATE (IN DOLLAR VALUE) EAST OF THE MISSISSIPPI RIVER, AND FIFTH LARGEST IN THE COUNTRY. MINERAL RESOURCES ARE EXHAUSTIBLE AND MUST CONSTANTLY BE REPLACED THROUGH NEW DISCOVERIES AND AWARENESS OF FACTORS RESPONSIBLE FOR LOCALIZING EACH MINERAL DEPOSIT. DETAILED GEOLOGIC DATA ARE OF PRIMARY IMPORTANCE IN AIDING THE EFFICIENCY AND ECONOMICS OF MINERAL UTILIZATION.

GEOLOGIC MAPPING AND RESEARCH HAVE APPLICATIONS FAR BEYOND THE AREA OF MINERAL RESOURCE DEVELOPMENT AND UTILIZATION. THE CHOICE OF SITES FOR HIGHWAYS, BRIDGES, DAMS, INDUSTRIAL BUILDINGS AND SCHOOLS IS GOVERNED BY THE KIND OF ROCK INVOLVED, THE EASE AND COST OF ROCK EXCAVATION, AND THE AVAILABILITY OF ROCK MATERIAL FOR CONSTRUCTION PURPOSES. THE AVAILABILITY OF GROUND WATER THROUGH WATER WELLS FOR DRINKING AND INDUSTRIAL PURPOSES IS A DIRECT FUNCTION OF THE TYPE AND STRUCTURE OF THE UNDERLYING ROCKS. THE ESTABLISHMENT OF LAKES FOR RECREATION AND FLOOD CONTROL IS GOVERNED BY THE NATURE OF THE ROCKS OF AN AREA. EFFECTIVE CONSERVATION, INCLUDING CONTROL OF GROUNDWATER POLLUTION, PRESERVATION OF VALUABLE MINERAL RESOURCES AND EFFICIENT LAND USE PLANNING, ALL REQUIRE A THOROUGH KNOWLEDGE OF THE ROCK FORMATIONS AS RECORDED ON THE GEOLOGIC MAPS AND TEXTS PREPARED BY THIS BUREAU.



THE WATER WELL DRILLERS LICENSING ACT ENABLES THE BUREAU TO COLLECT INFORMATION ON THE WATER-BEARING FORMATIONS OF THE COMMONWEALTH. WHEN ENGAGED TO DRILL A WELL THE DRILLERS ARE REQUIRED UNDER THE PROVISIONS OF THIS ACT TO FILE WITH THE BUREAU "INTENT TO DRILL" CARDS AND TO KEEP A DETAILED RECORD OF EACH WELL THEY DRILL; THESE DATA ENABLE OUR GEOLOGISTS TO PRODUCE MORE ACCURATE GEOLOGIC MAPS AND GROUNDWATER REPORTS, WHICH IN TURN HELPS THE INDIVIDUAL DRILLER FIND ADDITIONAL SUPPLIES OF GROUND WATER.



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  - GEOLOGIC INTERPRETATION OF AEROMAGNETIC DATA
  - GEOLOGIC EDUCATION TECHNIQUES
  - CONSERVATION OF MINERAL RESOURCES
  - GROUND WATER UTILIZATION
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